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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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VERIZON CORPORATE SERVICES GROUP INC. C/O CHRISTIAN R. ANDERSEN 600 HIDDEN RIDGE DRIVE MAILCODE HQEO3H14 IRVING, TX 75038			MATTIS, JASON E	
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			2665	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. ✗ 09/656,868	Applicant(s) VEENEMAN, DALE E.	
	Examiner Jason E Mattis	Art Unit 2665	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-36 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-36 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

1. This Office Action is in response to Applicant's amendment filed on 10/26/04. Claims 1-36 are currently pending in this application.

Claim Rejections - 35 USC § 103

2. Claims 1-11, 13-14, 17-28, 30-31 and 35-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Liu et al. (U.S. Pat. 6266395) in view of Bell Laboratories – Transmission Systems For Communications (U).

Liu et al., in the analogous field of communications, teaches a method and apparatus for qualification of subscriber loops for xDSL services (col. 2 line 57 – col. 3 line 40). **Regarding claims 1 and 17**, Liu et al. teaches the use of a physical (topological) database for the subscriber loop which is provided from a carrier service provider database (fig. 1 106 and col. 6 lines 18 – 36). The equivalent loop circuit is determined for the subscriber loop (fig. 7-9) from the physical information database including a particular loop length and a particular loop gauge (col. 6 lines 32-36). The DSL performance (data rate or capacity) is determined for the equivalent loop and the DSL performance (data rate or capacity) is predicted from the equivalent loop (col. 7 line 5 – col. 11 line 26). Liu et al., does not teach the use of equivalent straight cable for determining performance of a DSL system.

Regarding claim 18, Liu et al. teaches a processor that is responsive to instructions, which are stored in a memory, to perform a subscriber loop qualification process (col. 6 line 18 to col. 7 line 5). Liu et al. also teaches the use of a physical (topological) database for the subscriber loop which is provided from a carrier service provider database (fig. 1 106 and col. 6 lines 18 – 36). The equivalent loop circuit is determined for the subscriber loop (fig. 7-9) from the physical information database including a particular loop length and a particular loop gauge (col. 6 lines 32-36). The DSL performance (data rate or capacity) is determined for the equivalent loop and the DSL performance (data rate or capacity) is predicted from the equivalent loop (col. 7 line 5 – col. 11 line 26). Liu et al., does not teach the use of equivalent straight cable for determining performance of a DSL system.

Regarding claim 35, Liu et al, in the analogous field of communications, teaches a method and apparatus for qualification of subscriber loops for xDSL services (col. 2 line 57 – col. 3 line 40). The equivalent loop circuit is determined for the subscriber loop (fig. 7-9) from the physical information database including a particular loop length and a particular loop gauge (col. 6 lines 32-36). The DSL performance (data rate or capacity) is determined for the equivalent loop and the DSL performance (data rate or capacity) is predicted from the equivalent loop (col. 7 line 5 – col. 11 line 26). Liu et al., does not teach the use of equivalent straight cable for determining performance of a DSL system.

Regarding claim 36, Liu et al., in the analogous field of communications, teaches xDSL includes ADSL (col. 1 lines 18-26) and also teaches the apparatus and method can be applied to xDSL (col. 2 lines 45-47). Hence ADSL applications are

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supported. This is equivalent to providing a method and system for predicting digital subscriber line (DSL) performance on an existing telephone loop, comprising: obtaining a topological description of the existing telephone loop; identifying an equivalent loop to the existing telephone loop from the topological description of the existing telephone loop; determining DSL performance for the equivalent loop; and predicting DSL performance for the existing telephone loop from the DSL performance for the equivalent loop (claims 1, 17); and to a method for predicting asymmetric digital subscriber line (ADSL) performance on an existing telephone loop, comprising: determining characteristics and operating conditions of the existing telephone loop; calculating ADSL capacity of the existing telephone loop based on the determined characteristics; identifying an equivalent loop based on the ADSL capacity and the determined operating conditions of the existing telephone loop; determining ADSL performance on the equivalent loop; and predicting ADSL performance on the existing telephone loop from the determined ADSL performance on the equivalent loop (claim 36). Liu et al., does not teach the use of equivalent straight cable for determining performance of a DSL system.

Equivalent straight cable is useful to determine performance when, for example, a bridged tap is present in the subscriber loop. The conversion of a bridged tap circuit into an equivalent circuit without a bridge tap (i.e., straight cable circuit) is well known in the art of loop transmission design. The reference from Bell Laboratories, for example, teaches the method of converting such a cable circuit arrangement with bridge taps into an equivalent circuit without bridge taps, i.e., a straight cable circuit (p. 231-232 and

figure 10-17). These features have the advantage of simplifying the modeling of a complex loop circuit.

It would have been obvious for one of ordinary skill in the art at the time of the invention, when presented with the work of Bell Laboratories – Transmission Systems For Communications, to apply the conversion method from bridged tap loop cable circuit to a straight loop cable circuit to the methods and system of Liu et al., with the motivation to simplify the DSL performance estimation process.

Regarding claims 2 and 19, Liu et al., in the analogous field of communications discloses the database provides information including: frequency, length, gauge, temperature and insulation type associated with the subscriber loop (col. 6 lines 29-36, col. 8 line 6 – col. 9 line 18, col. 13 lines 25-30) as required by the claims.

Regarding claims 3 and 20, Liu et al., in the analogous field of communications discloses determining of an insertion loss (loop attenuation) based on topological description (col. 10 lines 28 - 58) as required by the claims.

Regarding claims 4 and 21, Liu et al., in the analogous field of communications discloses determining DSL capacity using the insertion loss (col. 10 lines 28 – 58) as required by the claims.

Regarding claims 5 and 22, Liu et al., in the analogous field of communications discloses creating a loss for a sub-channel, using this to generate SNR for each sub-channel and converting this to performance (bit rate). The overall bandwidth is obtained by summing the result. Summing a discrete set of values is equivalent to computing the area under the curve (col. 10 line 28 – col. 11 line 16). Since SNR is directly related to

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loss and summing equates to integration, this is equivalent to creating a loss curve using the insertion loss, and integrating the loss curve to determine the DSL capacity as required by the claims.

Regarding claims 6 and 23, Liu et al., in the analogous field of communications discloses creating a loss for each sub-channel frequency, using this to generate SNR for each sub-channel frequency and converting this to performance (bit rate). The overall bandwidth (DSL performance) is obtained by summing the result for each frequency. Summing a discrete set of values is equivalent to computing the area under the curve (col. 10 line 28 – col. 11 line 16). Since SNR is directly related to loss and summing equates to integration, this is equivalent to creating a loss curve based on the insertion loss over a plurality of frequencies, and determining an area below the loss curve over the plurality of frequencies, the area corresponding to the DSL capacity of the existing telephone loop.

Regarding claims 7, 9, 24, and 26, Liu et al., in the analogous field of communications discloses the loop includes an upstream and downstream path and determines DSL capacity each for upstream and downstream paths (col. 7 line 55 – col. 8 line 5, col. 10 line 50 – col. 11 line 16) as required by the claims.

Regarding claims 8 and 25, Liu et al., in the analogous field of communications discloses determining DSL capacity from topological description of the loop (col. 8 line 6 – col. 10 line 58) as required by the claims.

Regarding claims 10 and 27, Liu et al., in the analogous field of communications discloses determining equivalent loops for upstream and downstream

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paths using R, L, G, and C parameters (col. 8 line 6 – 33), which are handled separately as, indicated (col. 7 line 60 – col. 10 line 58).

Regarding claims 11 and 28, Liu et al., in the analogous field of communications discloses using the DSL bandwidth (col. 7 line 60 to col. 8 line 4), which is a measure of capacity to identify the equivalent loop.

Regarding claims 13 and 30, Lie et al., in the analogous field of communications discloses determining physical characteristics including the length of a loop (col. 7 lines 6-33) from information including gauge and insulation type (col. 6 lines 32-36).

Regarding claims 14 and 31, Liu et al., in the analogous field of communications discloses determining DSL performance for a number of DSL types (col. 2 line 45-47) and hence different types of rates are associated with different types of DSL services (ADSL, VDSL, SDSL, etc.) which is equivalent to selecting DSL performance data from a plurality of previously obtained DSL performance data.

3. Claims 15, 16, 32 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Liu et al. in view of Bell Laboratories – Transmission Systems For Communications as applied to claims 1-11, 13-14, 17-28, 30-31 and 35-36 above, and further in view of Millbrandt (US 6,633,545).

Liu et al, in the analogous field of communications, teaches a method and apparatus for qualification of subscriber loops for xDSL services as noted for the claims above. Bell Laboratories – Transmission Systems For Communications teaches a

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method for converting bridged tap loops into straight loops as noted for the claims above.

Liu et al., and Bell Laboratories – Transmission Systems For Communications references do not teach the selecting DSL performance data under different cross talk and spectral density conditions. Millbrandt, in the analogous field of communications, teaches a method and system for determining the data rate capacity of a DSL line, which incorporates the effects of power spectral density and cross talk (col. 26 line 37 – col. 27 line 15). This is equivalent to selecting DSL performance data from a plurality of DSL performance data for loops of different lengths under different cross talk conditions (claims 15, 32) and, determining spectral interference conditions associated with the existing telephone loop, and predicting the DSL performance of the existing telephone loop based on the DSL performance for the equivalent loop and the determined spectral interference conditions (claims 16, 33). These features have the advantage of improving a supplier's ability to more accurately predict the DSL performance that the user can expect over a given subscriber loop.

It would have been obvious for one of ordinary skill in the art at the time of the invention, when presented with the data rate determining features of Millbrandt, to apply the PSD and cross talk features of Millbrandt to the method and system of Liu et al. and Bell Laboratories – Transmission Systems for Communications, with the motivation to provide better service to the customer.

4. Claims 12, 29 and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Liu et al. (US 6,266,395), Bell Laboratories – Transmission Systems for Communications, and Millbrandt as applied to claims 15, 16, 32 and 33 above, and further in view of Tennyson (US 6,466,647).

Liu et al, in the analogous field of communications, teaches a method and apparatus for qualification of subscriber loops for xDSL services as noted for the claims above. Bell Laboratories – Transmission Systems For Communications teaches a method for converting bridged tap loops into straight loops as noted for the claims above. Millbrandt teaches a method and system which includes the impact of PSD and cross talk as noted for the claims above.

Liu et al., Bell Laboratories – Transmission Systems for Communications, and Millbrandt do not teach the use of a computer readable medium and locating the DSL capacity (rate) in a table. Tennyson, in the analogous field of communications, teaches a method and system for determining the data rate capacity of a DSL line which includes a computer disk (col. 11 line 7-13) and table to store the data rate capacity (col. 11 lines 43-44 and col. 12 lines 44-50). This is equivalent to providing a computer-readable medium that stores instructions executable by one or more processors to perform a method for estimating digital subscriber line (DSL) performance on a customer telephone loop, comprising: instructions for determining operating conditions for the customer telephone loop; instructions for identifying a loop of a particular length that corresponds to the customer telephone loop operating under the determined operating conditions; instructions for determining DSL performance for the loop of the

particular length; and instructions for estimating DSL performance for the customer telephone loop from the DSL performance for the loop of the particular length (claim 34) and, locating the DSL capacity in a table, and finding the equivalent loop that corresponds to the DSL capacity in the table (claims 12, 29). These features have the advantage of a computer readable medium and simple table lookup.

It would have been obvious for one of ordinary skill in the art at the time of the invention, when presented with the table lookup and computer readable medium features of Tennyson, to apply these features to the system and methods of Liu et al., Bell Laboratories – Transmission Systems for Communications, and Millbrandt, with the motivation to provide simple computer-based implementation of the features.

Response to Arguments

5. Applicant's arguments filed 10/26/04 have been fully considered but they are not persuasive.

In response to Applicant's argument that:

"Principal reference Liu et al. is deficient as a reference with respect to the claimed subject matter of all of Applicant's claims because it does not disclose or suggest the "test loop different from the existing telephone loop" of independent claim 1, the recited "each of the other loops being a test loop" of independent claim 17, the recited "test loops different from the customer telephone loops" of independent claim 18, the recited "different,

test loop" of independent claim 34, the recited "straight cable" vs. the recited "telephone line" of independent claim 35, or the recited "different, test loop" of independent claim 36." (See page 13 of Applicant's Remarks)

the Examiner respectfully disagrees. Liu et al. discloses taking measurements of an existing telephone loop and using the measurement results as inputs to equations that calculate values that determine the DSL performance of segments of the existing telephone loop. The claimed "test loops different from the existing telephone loop" is met by the use of the equations of Liu et al. Rather than calculate a bit rate of an existing telephone loop directly, Liu et al. uses equations that simulate an equivalent "test loop", which is different than the physical existing telephone loop. The equations used offer an approximation of the performance of the existing telephone loop; therefore, by using the results of the equations, which give results for a "test loop" that is different from the existing telephone loop, the performance of the physical existing telephone loop is predicted, as claimed.

In response to the Applicant's argument that:

"Because each loop being described in Liu et al. is an existing, subscriber loop it cannot be Applicant's claimed loop which is a "different" loop based on topological data suggesting loop performance equivalent to that of the subscriber loop. Applicant's "equivalent loop" is a loop upon which tests can be run, as noted above, to obtain performance data that would be accurately reflective of performance of the subscriber loop to which it is

equivalent, and in that sense it can be view as a test loop equivalent to that subscriber loop.” (See page 14 of Applicant’s Remarks)

the Examiner respectfully disagrees. There is no limitation in the claims that precludes the identified “test loop” from being a non-physical, simulation of a loop. The equations of Liu et al. conform to a “test loop”, which is an equivalent loop for the existing telephone loop. There is no present limitation in the claims that limits the test loop to “a loop upon which (physical) tests can be run”.

Conclusion

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason E Mattis whose telephone number is (571) 272-3154. The examiner can normally be reached on M-F 8AM-4:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Huy Vu can be reached on (571) 272-3155. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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